LIVINGSTON MUNICIPAL DRINKING WATER SAMPLING RESULTS
LIVINGSTON, MONTANA

STATE DOCUMENTS COLLECTION

[illegible] 1994

MONTANA STATE LIBRARY
1515 E. 6th AVE.
HELENA, MONTANA 59620

September 1989

Submitted To:

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SERVICES
Cogswell Building
Helena, Montana 59807

Submitted By:

BURLINGTON NORTHERN RAILROAD
9401 Indian Creek Parkway
Overland Park, Kansas 66201

Prepared by:

ENVIROCON, INC.
101 International Way
P.O. Box 8243
Missoula, Montana 59807

Submittal Date:

October 16, 1989

WLN89- 416019

1.0 INTRODUCTION

Envirocon Inc. (Envirocon), representing Burlington Northern Railroad, investigated the Livingston municipal drinking water system in response to a request by the Montana Department of Health and Environmental Sciences (MDHES). The investigation included collecting and analyzing water samples from five residential and business taps and the one million gallon storage tank. Samples were collected on September 20, 1989 at the locations shown on Figure 1.

The sample locations were chosen based upon a technical evaluation of the water supply system by Envirocon. Envirocon chose sample locations which were determined to provide water samples most likely to contain chlorinated organics originating from the rail yard if they exist. Envirocon determined through the water system evaluation that the areas most likely to contain chlorinated organics include supply lines adjacent to the Q and L street municipal wells, and dead-end lines where there is a lesser degree of flushing.

2.0 METHODOLOGY

Water samples were collected, handled, and shipped according to Section 9.0 of the Interim Remedial Measures Work Plan (IRMWP, Envirocon, 1989). Samples were collected from faucets at all locations except for the storage tank where a stainless steel bailer was used. All tap samples were taken after water was allowed to run from the faucets for 3 to 5 minutes. A total of 8 samples were collected. An additional sample was taken as a field duplicate, and one was obtained as a trip blank. All samples were packed in ice and transported by contracted courier to the Energy Laboratory, Inc. (ELI) in Billings, Montana for analysis.

3.0 RESULTS

EL analyzed the tap water and tank samples according to EPA method 524.2 as summarized in Table 1.0. Complete lab results are compiled in Appendix A.

No detectable concentrations of the chlorinated solvents analyzed for by EPA method 524.2 were found in any samples; however, several species of trihalomethanes were detected in low concentrations ranging from 1.0 to 2.2 ug/l.

4.0 INTERPRETATION

Envirocon interprets the results to indicate that the municipal water system contains no detectable concentrations of the chlorinated organic solvents. The trihalomethanes detected, such as chloroform and bromoform, are interpreted as a result of chlorination of city water at the wellhead. Similar compounds at similar concentrations have been detected in water samples obtained from the municipal wells.

5.0 RESPONSE TO MDHES COMMENTS

The following section has been prepared in response to comments submitted to Envirocon by John Arrigo on September 26, 1989. These comments were submitted to Envirocon following the investigation and Envirocon chose to review the investigative results prior to formulating a response.

The sample locations chosen were biased to provide worst-case results. Envirocon interprets the results to indicate that the current system contains no detectable chlorinated organic solvents. Concerns expressed in the MDHES letter dated September 26, 1989 regarding sampling of the Livingston distribution system are addressed as follows:

Concern #1: A peak daily water demand in the system could lower pressure in lines that are below the water table and allow contaminants to enter the distribution system through leaks in those lines.

Response: Envirocon sampled two locations close to the Q and L Street wells where lines may be below the water table during high water periods. Envirocon has found no technical information which indicates that the supply lines become negatively pressured during peak demands periods. The net fluid pressure within the water lines would, at a worst, case be a function of the static applied head to the system. Since this head would originate at a source point presumable at or near the surface the fluid pressure within the lines would always exceed the pressure on the outside of the pipe due to the groundwater. Therefore, unless the pipeline was only partially full of water such as by leakage it would be impossible for groundwater to enter the system. In addition, no leaks have been reported or identified in the eastern part of the distribution system in the past 10 years according to Owen Engen, Livingston Water Department.

Concern #2: The age and construction of the water lines must be evaluated.

Response: Envirocon has conducted an extensive evaluation of the water system including integrity and construction details. All distribution lines are constructed of cast iron. In addition, there have been no major leaks reported in the distribution system indicating relatively good line integrity. No PVC lines exist in the system, except possibly the two private lines which were sampled.

Concern #3: Background samples should be taken in the western portion of the city.

Response: The distribution system is a network and any particular area can be served from a number of sources. Attempting to measure background levels is unreasonable because of the networking and that much of the water serving the system comes from storage tanks filled by the operational wells. This tank serves as a mixing and equalization chamber making it impossible to determine background water quality from water dispersed throughout the lines. Such samples are not felt necessary since sampling events conducted on the production wells which show good correlation to the results from the water line results may be considered background levels.

Concern #4: There may be a greater chance of contaminants to enter the distribution system near the rail yard where concentrations of chlorinated organics in the ground water are greater.

Response: Contaminant concentrations in the ground water may be greater near the rail yard but the distribution lines are a minimum of 12 feet above the water table. The only other possibility would be if distribution lines were to contact contaminants within an infiltration zone. There are two lines which transect the rail yard. One is a dead end line under the Livingston Rebuild Center and the other crosses at L Street. Envirocon has evaluated these two lines and will sample the dead-end line into the shops. Samples will be taken concurrently with the October monthly sampling round. Results will be submitted in a letter report.

Concern #5: Sediment in dead-end lines may contain chlorinated organic compounds.

Response: The sampling points chosen for the investigation concentrated on dead-end lines which are estimated as being the most likely supply lines to contain chlorinated organics if present. The results indicate no detectable chorinated organic solvents. In addition, the detection limits for sediment samples would be greater than the anticipated concentrations within the sludge samples if present.

6.0 QA/QC

Envirocon followed the QA/QC program outlined in Section 10.0 of the Interim Remedial Measures Work Plan (IRMWP) during the sampling of the Livingston Municipal Water System. This program includes:

- Field QA/QC-
  - field duplicates
  - trip blanks
  - equipment blanks
- Laboratory QA/QC-
  - spiked analysis
  - laboratory duplicates
  - EPA QA/QC samples

QA/QC samples were analyzed by the same EPA method 524.2 as the field samples.

6.1 FIELD QA/QC

One field duplicate and one trip blank were used to validate field procedures.

6.1.1 Field Duplicates

A field duplicate was performed at the Barnhart residence and sent blind to ELI. As shown in Table 1.0, analysis of the duplicate indicates excellent correlation with the original sample collected. This indicates that laboratory procedures are sufficient to generate reproducible results.

6.1.2 Trip Blanks

As shown in Table 1.0, no analytes were detected in the trip blank. This indicates that sample handling and shipping protocols were sufficient to maintain sample integrity.

6.1.3 Equipment Blank

No equipment blank was taken because the method of sampling was primarily from the source.

6.2 LABORATORY QA/QC

Energy Laboratories conducted a spiked analysis, one laboratory duplicate analysis, and one set of EPA QA/QC samples to validate laboratory procedures. ELI's QA/QC plan is on file with the MDHES.

6.2.1 Spiked Analysis

The spiked analysis was conducted on sample 140101-111 (B Street Well). This sample point was not part of the Livingston Municipal Water System sample program but was included in the sampling because the well was not available for sampling during the previous monthly round. Results of this analysis are shown in Appendix A. The recoveries of the test values are all within the acceptable percentage ranges. The results indicate that ELI's laboratory equipment and procedures were adequate to provide satisfactory results.

6.2.2 Laboratory Duplicate Analysis

ELI performed a duplicate analysis on sample 140101-110, coincident with the trip blank. The results indicate that laboratory equipment and procedures were adequate to provide reproducible analytical results.

6.2.3 EPA QA/QC Sample Analysis

ELI analyzed one set of EPA QA/QC reference samples in addition to samples submitted by Envirocon. All test values were within acceptable percentage ranges for recovery. The results indicate that laboratory equipment and procedures were adequate to provide accurate results.

1 Rainbow Motel

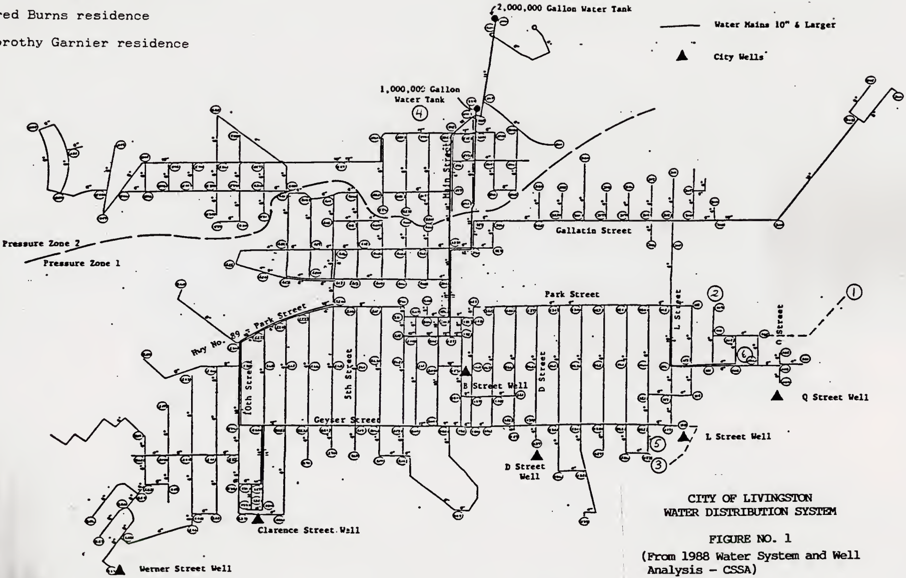
2 Park and N Street line (Trail Ride Inn)

3 Barnhart residence

4 1 million gallon water tank

5 Fred Burns residence

6 Dorothy Garnier residence



CITY OF LIVINGSTON
WATER DISTRIBUTION SYSTEM

FIGURE NO. 1
(From 1988 Water System and Well Analysis – CSSA)

TABLE 1.0

LIVINGSTON MUNICIPAL WATER SYSTEM
SUMMARY OF WATER ANALYSES
Sep-89

SAMPLE LOCATION	SAMPLE NUMBER	SAMPLE METHOD	Bromodichloromethane	Dibromochloromethane	Bromoform
Storage tank	140101-104	bailer	N.D.	1.1	1.5
Trail Ride Inn	140101-105	faucet	1	2.1	1.4
Garnier	140101-106	faucet	1	2.2	1.5
Barnhart	140101-107	faucet	N.D.	1.1	1
Barnhart (dup)	140101-108	faucet	N.D.	1.1	N.D.
Burns	140101-109	faucet	N.D.	1.1	N.D.
Rainbow Motel	140101-112	faucet	1	1.9	1.3
Trip Blank	140101-110	N.A.	N.D.	N.D.	N.D.

APPENDIX A

Sampling Results

ENVIROCON, INC.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16174
DATE: 09/28/89 dya

1,000,000 gal
Storage tank

WATER ANALYSIS
Livingston/BN
140101-104
Sampled 09/20/89 @ 0805
Submitted 09/21/89

Volatile Organic Constituent	µg/l	Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0	1,1,1,2-Tetrachloroethane	<1.0
Chloromethane	<1.0	Ethylbenzene	<1.0
Vinyl chloride	<0.50	p-Xylene	<1.0
Bromomethane	<1.0	m-Xylene	<1.0
Chloroethane	<1.0	o-Xylene	<1.0
Trichlorofluoromethane	<1.0	Styrene	<1.0
1,1-Dichloroethene	<0.50	Bromoform	1.5
Methylene Chloride	<1.0	Isopropylbenzene	<1.0
trans-1,2-Dichloroethene	<1.0	1,1,2,2-Tetrachloroethane	<1.0
1,1-Dichloroethane	<1.0	Bromobenzene	<1.0
2,2-Dichloropropane	<1.0	1,2,3-Trichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0	n-Propylbenzene	<1.0
Chloroform	<1.0	2-Chlorotoluene	<1.0
Bromochloromethane	<1.0	1,3,5-Trimethylbenzene	<1.0
1,1,1-Trichloroethane	<0.50	4-Chlorotoluene	<1.0
Carbon Tetrachloride	<0.50	tert-Butylbenzene	<1.0
1,1-Dichloropropene	<1.0	1,2,4-Trimethylbenzene	<1.0
Benzene	<0.50	sec-Butylbenzene	<1.0
1,2-Dichloroethane	<0.50	p-Isopropyltoluene	<1.0
Trichloroethene	<0.50	1,3-Dichlorobenzene	<1.0
1,2-Dichloropropane	<1.0	1,4-Dichlorobenzene	<0.50
Bromodichloromethane	<1.0	n-Butylbenzene	<1.0
Dibromomethane	<1.0	1,2-Dichlorobenzene	<1.0
Toluene	<1.0	1,2-Dibromo-3-Chloropropane	<1.0
1,1,2-Trichloroethane	<1.0	1,2,4-Trichlorobenzene	<1.0
Tetrachloroethene	<0.50	Hexachlorobutadiene	<1.0
1,3-Dichloropropane	<1.0	Naphthalene	<1.0
Dibromochloromethane	1.1	1,2,3-Trichlorobenzene	<1.0
1,2-Dibromoethane	<1.0	cis-1,3-Dichloropropene	<1.0
Chlorobenzene	<1.0	trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-673-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16175
DATE: 09/28/89 dya

WATER ANALYSIS
Livingston/BN
140101-105
Sampled 09/20/89 @ 0841
Submitted 09/21/89

Trail Ride Inn

Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0
Chloromethane	<1.0
Vinyl chloride	<0.50
Bromomethane	<1.0
Chloroethane	<1.0
Trichlorofluoromethane	<1.0
1,1-Dichloroethene	<0.50
Methylene Chloride	<1.0
trans-1,2-Dichloroethene	<1.0
1,1-Dichloroethane	<1.0
2,2-Dichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0
Chloroform	<1.0
Bromochloromethane	<1.0
1,1,1-Trichloroethane	<0.50
Carbon Tetrachloride	<0.50
1,1-Dichloropropene	<1.0
Benzene	<0.50
1,2-Dichloroethane	<0.50
Trichloroethene	<0.50
1,2-Dichloropropane	<1.0
Bromodichloromethane	1.0
Dibromomethane	<1.0
Toluene	<1.0
1,1,2-Trichloroethane	<1.0
Tetrachloroethene	<0.50
1,3-Dichloropropane	<1.0
Dibromochloromethane	2.1
1,2-Dibromoethane	<1.0
Chlorobenzene	<1.0

Volatile Organic Constituent	µg/l
1,1,1,2-Tetrachloroethane	<1.0
Ethylbenzene	<1.0
p-Xylene	<1.0
m-Xylene	<1.0
o-Xylene	<1.0
Styrene	<1.0
Bromoform	1.4
Isopropylbenzene	<1.0
1,1,2,2-Tetrachloroethane	<1.0
Bromobenzene	<1.0
1,2,3-Trichloropropane	<1.0
n-Propylbenzene	<1.0
2-Chlorotoluene	<1.0
1,3,5-Trimethylbenzene	<1.0
4-Chlorotoluene	<1.0
tert-Butylbenzene	<1.0
1,2,4-Trimethylbenzene	<1.0
sec-Butylbenzene	<1.0
p-Isopropyltoluene	<1.0
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<0.50
n-Butylbenzene	<1.0
1,2-Dichlorobenzene	<1.0
1,2-Dibromo-3-Chloropropane	<1.0
1,2,4-Trichlorobenzene	<1.0
Hexachlorobutadiene	<1.0
Naphthalene	<1.0
1,2,3-Trichlorobenzene	<1.0
cis-1,3-Dichloropropene	<1.0
trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16176
DATE: 09/28/89 dya

WATER ANALYSIS
Livingston/BN
140101-106
Sampled 09/20/89 @ 0859
Submitted 09/21/89

Garnier
Residence

Volatile Organic Constituent	µg/l	Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0	1,1,1,2-Tetrachloroethane	<1.0
Chloromethane	<1.0	Ethylbenzene	<1.0
Vinyl chloride	<0.50	p-Xylene	<1.0
Bromomethane	<1.0	m-Xylene	<1.0
Chloroethane	<1.0	o-Xylene	<1.0
Trichlorofluoromethane	<1.0	Styrene	<1.0
1,1-Dichloroethene	<0.50	Bromoform	1.5
Methylene Chloride	<1.0	Isopropylbenzene	<1.0
trans-1,2-Dichloroethene	<1.0	1,1,2,2-Tetrachloroethane	<1.0
1,1-Dichloroethane	<1.0	Bromobenzene	<1.0
2,2-Dichloropropane	<1.0	1,2,3-Trichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0	n-Propylbenzene	<1.0
Chloroform	<1.0	2-Chlorotoluene	<1.0
Bromochloromethane	<1.0	1,3,5-Trimethylbenzene	<1.0
1,1,1-Trichloroethane	<0.50	4-Chlorotoluene	<1.0
Carbon Tetrachloride	<0.50	tert-Butylbenzene	<1.0
1,1-Dichloropropene	<1.0	1,2,4-Trimethylbenzene	<1.0
Benzene	<0.50	sec-Butylbenzene	<1.0
1,2-Dichloroethane	<0.50	p-Isopropyltoluene	<1.0
Trichloroethene	<0.50	1,3-Dichlorobenzene	<1.0
1,2-Dichloropropane	<1.0	1,4-Dichlorobenzene	<0.50
Bromodichloromethane	1.0	n-Butylbenzene	<1.0
Dibromomethane	<1.0	1,2-Dichlorobenzene	<1.0
Toluene	<1.0	1,2-Dibromo-3-Chloropropane	<1.0
1,1,2-Trichloroethane	<1.0	1,2,4-Trichlorobenzene	<1.0
Tetrachloroethene	<0.50	Hexachlorobutadiene	<1.0
1,3-Dichloropropane	<1.0	Naphthalene	<1.0
Dibromochloromethane	2.2	1,2,3-Trichlorobenzene	<1.0
1,2-Dibromoethane	<1.0	cis-1,3-Dichloropropene	<1.0
Chlorobenzene	<1.0	trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16177
DATE: 09/28/89 dya

WATER ANALYSIS
Livingston/BN
140101-107
Sampled 09/20/89 @ 0930
Submitted 09/21/89

Barnhart

Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0
Chloromethane	<1.0
Vinyl chloride	<0.50
Bromomethane	<1.0
Chloroethane	<1.0
Trichlorofluoromethane	<1.0
1,1-Dichloroethene	<0.50
Methylene Chloride	<1.0
trans-1,2-Dichloroethene	<1.0
1,1-Dichloroethane	<1.0
2,2-Dichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0
Chloroform	<1.0
Bromochloromethane	<1.0
1,1,1-Trichloroethane	<0.50
Carbon Tetrachloride	<0.50
1,1-Dichloropropene	<1.0
Benzene	<0.50
1,2-Dichloroethane	<0.50
Trichloroethene	<0.50
1,2-Dichloropropane	<1.0
Bromodichloromethane	<1.0
Dibromomethane	<1.0
Toluene	<1.0
1,1,2-Trichloroethane	<1.0
Tetrachloroethene	<0.50
1,3-Dichloropropane	<1.0
Dibromochloromethane	1.1
1,2-Dibromoethane	<1.0
Chlorobenzene	<1.0

Volatile Organic Constituent	µg/l
1,1,1,2-Tetrachloroethane	<1.0
Ethylbenzene	<1.0
p-Xylene	<1.0
m-Xylene	<1.0
o-Xylene	<1.0
Styrene	<1.0
Bromoform	1.0
Isopropylbenzene	<1.0
1,1,2,2-Tetrachloroethane	<1.0
Bromobenzene	<1.0
1,2,3-Trichloropropane	<1.0
n-Propylbenzene	<1.0
2-Chlorotoluene	<1.0
1,3,5-Trimethylbenzene	<1.0
4-Chlorotoluene	<1.0
tert-Butylbenzene	<1.0
1,2,4-Trimethylbenzene	<1.0
sec-Butylbenzene	<1.0
p-Isopropyltoluene	<1.0
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<0.50
n-Butylbenzene	<1.0
1,2-Dichlorobenzene	<1.0
1,2-Dibromo-3-Chloropropane	<1.0
1,2,4-Trichlorobenzene	<1.0
Hexachlorobutadiene	<1.0
Naphthalene	<1.0
1,2,3-Trichlorobenzene	<1.0
cis-1,3-Dichloropropene	<1.0
trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16178
DATE: 09/28/89 dya

WATER ANALYSIS
Livingston/BN
140101-108
Sampled 09/20/89 @ 0935
Submitted 09/21/89

Barnhart
Duplicate

Volatile Organic Constituent	µg/l	Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0	1,1,1,2-Tetrachloroethane	<1.0
Chloromethane	<1.0	Ethylbenzene	<1.0
Vinyl chloride	<0.50	p-Xylene	<1.0
Bromomethane	<1.0	m-Xylene	<1.0
Chloroethane	<1.0	o-Xylene	<1.0
Trichlorofluoromethane	<1.0	Styrene	<1.0
1,1-Dichloroethene	<0.50	Bromoform	<1.0
Methylene Chloride	<1.0	Isopropylbenzene	<1.0
trans-1,2-Dichloroethene	<1.0	1,1,2,2-Tetrachloroethane	<1.0
1,1-Dichloroethane	<1.0	Bromobenzene	<1.0
2,2-Dichloropropane	<1.0	1,2,3-Trichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0	n-Propylbenzene	<1.0
Chloroform	<1.0	2-Chlorotoluene	<1.0
Bromochloromethane	<1.0	1,3,5-Trimethylbenzene	<1.0
1,1,1-Trichloroethane	<0.50	4-Chlorotoluene	<1.0
Carbon Tetrachloride	<0.50	tert-Butylbenzene	<1.0
1,1-Dichloropropene	<1.0	1,2,4-Trimethylbenzene	<1.0
Benzene	<0.50	sec-Butylbenzene	<1.0
1,2-Dichloroethane	<0.50	p-Isopropyltoluene	<1.0
Trichloroethene	<0.50	1,3-Dichlorobenzene	<1.0
1,2-Dichloropropane	<1.0	1,4-Dichlorobenzene	<0.50
Bromodichloromethane	<1.0	n-Butylbenzene	<1.0
Dibromomethane	<1.0	1,2-Dichlorobenzene	<1.0
Toluene	<1.0	1,2-Dibromo-3-Chloropropane	<1.0
1,1,2-Trichloroethane	<1.0	1,2,4-Trichlorobenzene	<1.0
Tetrachloroethene	<0.50	Hexachlorobutadiene	<1.0
1,3-Dichloropropane	<1.0	Naphthalene	<1.0
Dibromochloromethane	1.1	1,2,3-Trichlorobenzene	<1.0
1,2-Dibromoethane	<1.0	cis-1,3-Dichloropropene	<1.0
Chlorobenzene	<1.0	trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-3227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16179
DATE: 09/28/89 dya

WATER ANALYSIS
Livingston/BN
140101-109
Sampled 09/20/89 @ 1002
Submitted 09/21/89

Burns
Residence

Volatile Organic Constituent	µg/l	Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0	1,1,1,2-Tetrachloroethane	<1.0
Chloromethane	<1.0	Ethylbenzene	<1.0
Vinyl chloride	<0.50	p-Xylene	<1.0
Bromomethane	<1.0	m-Xylene	<1.0
Chloroethane	<1.0	o-Xylene	<1.0
Trichlorofluoromethane	<1.0	Styrene	<1.0
1,1-Dichloroethene	<0.50	Bromoform	<1.0
Methylene Chloride	<1.0	Isopropylbenzene	<1.0
trans-1,2-Dichloroethene	<1.0	1,1,2,2-Tetrachloroethane	<1.0
1,1-Dichloroethane	<1.0	Bromobenzene	<1.0
2,2-Dichloropropane	<1.0	1,2,3-Trichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0	n-Propylbenzene	<1.0
Chloroform	<1.0	2-Chlorotoluene	<1.0
Bromochloromethane	<1.0	1,3,5-Trimethylbenzene	<1.0
1,1,1-Trichloroethane	<0.50	4-Chlorotoluene	<1.0
Carbon Tetrachloride	<0.50	tert-Butylbenzene	<1.0
1,1-Dichloropropene	<1.0	1,2,4-Trimethylbenzene	<1.0
Benzene	<0.50	sec-Butylbenzene	<1.0
1,2-Dichloroethane	<0.50	p-Isopropyltoluene	<1.0
Trichloroethene	<0.50	1,3-Dichlorobenzene	<1.0
1,2-Dichloropropane	<1.0	1,4-Dichlorobenzene	<0.50
Bromodichloromethane	<1.0	n-Butylbenzene	<1.0
Dibromomethane	<1.0	1,2-Dichlorobenzene	<1.0
Toluene	<1.0	1,2-Dibromo-3-Chloropropane	<1.0
1,1,2-Trichloroethane	<1.0	1,2,4-Trichlorobenzene	<1.0
Tetrachloroethene	<0.50	Hexachlorobutadiene	<1.0
1,3-Dichloropropane	<1.0	Naphthalene	<1.0
Dibromochloromethane	1.1	1,2,3-Trichlorobenzene	<1.0
1,2-Dibromoethane	<1.0	cis-1,3-Dichloropropene	<1.0
Chlorobenzene	<1.0	trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16180
DATE: 09/28/89 dya

WATER ANALYSIS
Livingston/BN
140101-110
Sampled 09/20/89 @ 1015
Submitted 09/21/89

Trip
Blank

Volatile Organic Constituent	µg/l	Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0	1,1,1,2-Tetrachloroethane	<1.0
Chloromethane	<1.0	Ethylbenzene	<1.0
Vinyl chloride	<0.50	p-Xylene	<1.0
Bromomethane	<1.0	m-Xylene	<1.0
Chloroethane	<1.0	o-Xylene	<1.0
Trichlorofluoromethane	<1.0	Styrene	<1.0
1,1-Dichloroethene	<0.50	Bromoform	<1.0
Methylene Chloride	<1.0	Isopropylbenzene	<1.0
trans-1,2-Dichloroethene	<1.0	1,1,2,2-Tetrachloroethane	<1.0
1,1-Dichloroethane	<1.0	Bromobenzene	<1.0
2,2-Dichloropropane	<1.0	1,2,3-Trichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0	n-Propylbenzene	<1.0
Chloroform	<1.0	2-Chlorotoluene	<1.0
Bromochloromethane	<1.0	1,3,5-Trimethylbenzene	<1.0
1,1,1-Trichloroethane	<0.50	4-Chlorotoluene	<1.0
Carbon Tetrachloride	<0.50	tert-Butylbenzene	<1.0
1,1-Dichloropropene	<1.0	1,2,4-Trimethylbenzene	<1.0
Benzene	<0.50	sec-Butylbenzene	<1.0
1,2-Dichloroethane	<0.50	p-Isopropyltoluene	<1.0
Trichloroethene	<0.50	1,3-Dichlorobenzene	<1.0
1,2-Dichloropropane	<1.0	1,4-Dichlorobenzene	<0.50
Bromodichloromethane	<1.0	n-Butylbenzene	<1.0
Dibromomethane	<1.0	1,2-Dichlorobenzene	<1.0
Toluene	<1.0	1,2-Dibromo-3-Chloropropane	<1.0
1,1,2-Trichloroethane	<1.0	1,2,4-Trichlorobenzene	<1.0
Tetrachloroethene	<0.50	Hexachlorobutadiene	<1.0
1,3-Dichloropropane	<1.0	Naphthalene	<1.0
Dibromochloromethane	<1.0	1,2,3-Trichlorobenzene	<1.0
1,2-Dibromoethane	<1.0	cis-1,3-Dichloropropene	<1.0
Chlorobenzene	<1.0	trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16180 dup
DATE: 09/28/89 dya

QUALITY ASSURANCE - DUPLICATE ANALYSIS

Livingston/BN
140101-110
Sampled 09/20/89 @ 1015
Submitted 09/21/89

Lab dup of trip blank

Volatile Organic Constituent	µg/l	Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0	1,1,1,2-Tetrachloroethane	<1.0
Chloromethane	<1.0	Ethylbenzene	<1.0
Vinyl chloride	<0.50	p-Xylene	<1.0
Bromomethane	<1.0	m-Xylene	<1.0
Chloroethane	<1.0	o-Xylene	<1.0
Trichlorofluoromethane	<1.0	Styrene	<1.0
1,1-Dichloroethene	<0.50	Bromoform	<1.0
Methylene Chloride	<1.0	Isopropylbenzene	<1.0
trans-1,2-Dichloroethene	<1.0	1,1,2,2-Tetrachloroethane	<1.0
1,1-Dichloroethane	<1.0	Bromobenzene	<1.0
2,2-Dichloropropane	<1.0	1,2,3-Trichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0	n-Propylbenzene	<1.0
Chloroform	<1.0	2-Chlorotoluene	<1.0
Bromochloromethane	<1.0	1,3,5-Trimethylbenzene	<1.0
1,1,1-Trichloroethane	<0.50	4-Chlorotoluene	<1.0
Carbon Tetrachloride	<0.50	tert-Butylbenzene	<1.0
1,1-Dichloropropene	<1.0	1,2,4-Trimethylbenzene	<1.0
Benzene	<0.50	sec-Butylbenzene	<1.0
1,2-Dichloroethane	<0.50	p-Isopropyltoluene	<1.0
Trichloroethene	<0.50	1,3-Dichlorobenzene	<1.0
1,2-Dichloropropane	<1.0	1,4-Dichlorobenzene	<0.50
Bromodichloromethane	<1.0	n-Butylbenzene	<1.0
Dibromomethane	<1.0	1,2-Dichlorobenzene	<1.0
Toluene	<1.0	1,2-Dibromo-3-Chloropropane	<1.0
1,1,2-Trichloroethane	<1.0	1,2,4-Trichlorobenzene	<1.0
Tetrachloroethene	<0.50	Hexachlorobutadiene	<1.0
1,3-Dichloropropane	<1.0	Naphthalene	<1.0
Dibromochloromethane	<1.0	1,2,3-Trichlorobenzene	<1.0
1,2-Dibromoethane	<1.0	cis-1,3-Dichloropropene	<1.0
Chlorobenzene	<1.0	trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16182
DATE: 09/28/89 dya

Rainbow
Motel

WATER ANALYSIS
Livingston/BN
140101-112
Sampled 09/20/89 @ 1531
Submitted 09/21/89

Volatile Organic Constituent	µg/l	Volatile Organic Constituent	µg/l
Dichlorodifluoromethane	<1.0	1,1,1,2-Tetrachloroethane	<1.0
Chloromethane	<1.0	Ethylbenzene	<1.0
Vinyl chloride	<0.50	p-Xylene	<1.0
Bromomethane	<1.0	m-Xylene	<1.0
Chloroethane	<1.0	o-Xylene	<1.0
Trichlorofluoromethane	<1.0	Styrene	<1.0
1,1-Dichloroethene	<0.50	Bromoform	1.3
Methylene Chloride	<1.0	Isopropylbenzene	<1.0
trans-1,2-Dichloroethene	<1.0	1,1,2,2-Tetrachloroethane	<1.0
1,1-Dichloroethane	<1.0	Bromobenzene	<1.0
2,2-Dichloropropane	<1.0	1,2,3-Trichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0	n-Propylbenzene	<1.0
Chloroform	<1.0	2-Chlorotoluene	<1.0
Bromochloromethane	<1.0	1,3,5-Trimethylbenzene	<1.0
1,1,1-Trichloroethane	<0.50	4-Chlorotoluene	<1.0
Carbon Tetrachloride	<0.50	tert-Butylbenzene	<1.0
1,1-Dichloropropene	<1.0	1,2,4-Trimethylbenzene	<1.0
Benzene	<0.50	sec-Butylbenzene	<1.0
1,2-Dichloroethane	<0.50	p-Isopropyltoluene	<1.0
Trichloroethene	<0.50	1,3-Dichlorobenzene	<1.0
1,2-Dichloropropane	<1.0	1,4-Dichlorobenzene	<0.50
Bromodichloromethane	1.0	n-Butylbenzene	<1.0
Dibromomethane	<1.0	1,2-Dichlorobenzene	<1.0
Toluene	<1.0	1,2-Dibromo-3-Chloropropane	<1.0
1,1,2-Trichloroethane	<1.0	1,2,4-Trichlorobenzene	<1.0
Tetrachloroethene	<0.50	Hexachlorobutadiene	<1.0
1,3-Dichloropropane	<1.0	Naphthalene	<1.0
Dibromochloromethane	1.9	1,2,3-Trichlorobenzene	<1.0
1,2-Dibromoethane	<1.0	cis-1,3-Dichloropropene	<1.0
Chlorobenzene	<1.0	trans-1,3-Dichloropropene	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

LAB NO.: 89-16181 spi
DATE: 09/28/89 dya

QUALITY ASSURANCE - SPIKED ANALYSIS

Lab No. 89-16181 was spiked with each of the following constituents with these results:

Constituent	Spike Amount, µg/l	P (%)	Range for P (%)
Trichlorofluoromethane	5.0	94	60 - 140
trans-1,2-Dichloroethene	5.0	98	60 - 140
Dibromomethane	5.2	81	60 - 140
1,2-Dichloropropane	5.0	120	60 - 140
Dibromochloromethane	5.0	106	60 - 140
2-Chlorotoluene	5.0	110	60 - 140
1,4-Dichlorobenzene	5.1	110	60 - 140

P = Percent recovery measured.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

LABORATORY REPORT

TO: Envirocon
ADDRESS: P.O. Box 8243
Missoula, MT 59807

89-16169 -72
LAB NO.: 89-16174 -82
DATE: 09/07/89 dya

EPA WATER SUPPLY QUALITY CONTROL SAMPLE

Volatile Organic Contaminants

This EPA reference sample was analyzed with your lab no. 89-16169 -72 89-16174 -82 with the following results:

PARAMETER	True Value, μg/l	P (%)	Range for P, Ps (%)
Trichlorofluoromethane	5.0	86	60 - 140
trans-1,2-Dichloroethene	5.0	88	60 - 140
Dibromomethane	5.2	75	60 - 140
1,2-Dichloropropane	5.0	122	60 - 140
Dibromochloromethane	5.0	110	60 - 140
2-Chlorotoluene	5.0	90	60 - 140
1,4-Dichlorobenzene	5.1	98	60 - 140

P = Percent recovery measured.

cc: Envirocon, Livingston.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR
COGSWELL BUILDING
STATE OF MONTANA
FAX # (406) 444-2606
HELENA, MONTANA 59620

November 13, 1989

H. Crowell Herrick, II
Envirocon, Inc.
P.O. Box 8243
Missoula, MT 59807

RE: Livingston Municipal Water System Sampling

Dear Crowell:

Thank you for the October 16, 1989 report on the results of sampling the water distribution system and the follow up November 6, letter with results from analysis of the C&P Packing well. I agree with your opinion that the results indicate chlorinated solvents do not exist in the water system.

The October report however contains, in our opinion, inadequate responses to concerns identified by the Water Quality Bureau (WQB) in my September 26, 1989 letter to Kris Kok. We feel are these responses deserve a reply therefore I offer the following comments for your consideration. The numbering corresponds to the numbered concerns in your report.

Response 1. This response is inadequate to address the Department's concerns. The lack of reported leaks may or may not mean anything. During peak demands, fire flows or main breaks, it is clearly possible for negative pressures to occur within the distribution system. In these instances back siphonage into the distribution system could easily occur. Leaks generally do not surface where pipes are set in permeable alluvial formations and are not detected or reported unless the city surveys with leak detectors. The only way to assess if negative pressures occur is to preform a network hydraulic analysis under high demand flow scenarios or to monitor the pressure in the system during high demand events. Your statement that Envirocon has found no technical information which indicates that the supply lines become negatively pressured during peak demands needs supporting data.

"AN EQUAL OPPORTUNITY EMPLOYER"

Response 2. The WQB would like to receive copies of the extensive evaluations conducted on the Livingston water system's structural integrity. This should include evaluations of the age and condition of cast iron mains, leakage testing, records of main repairs, etc. The lack of major leaks may not be significant.

Response 3. Generally the water in the distribution system goes to the point of demand. It does not necessarily go to the storage tank for mixing and equalization. Therefore sampling in the western portion of the city should be conducted for comparison purposes.

Response 4. If a leak is present, soil around the leak will be saturated. If the soil is contaminated from surface spillage, such as in the railyard, water from the leak may mobilize contaminants. If back-siphonage occurs, the liquid could enter the system. How has Envirocon evaluated the two lines under the railyard?

Response 5. What about the sediment? Was any present? Was any sediment collected and analyzed? It would be advantageous to collect samples during flushing deadend mains to capture "stagnant" water samples, sediment, and to create localized low pressure zones where (if leaking pipes are submerged in contaminated ground water) contaminants may enter the system. Were samples collected while the fire department flushed lines in the southeastern portion of the city?

Feel free to contact me if you have any comments or questions. I look forward to your reply.

Sincerely,

John L Arrigo

John L. Arrigo
Ground Water Program Supervisor
Water Quality Bureau
Phone: (406) 444-2406

JA.174
cc: Dan Fraser, WQB
Vic Andersen, SHWB
John Orndorf, City of Livingston

ENVIROCON, INC.

101 INTERNATIONAL WAY
POST OFFICE BOX 8243
MISSOULA, MONTANA 59807
TELEPHONE: (406) 523-1150
FAX: (406) 721-4794

ENVIROCON, INC.

~~October~~ 6, 1989
November JT

John Arrigo
Water Quality Bureau
Room B201
Cogswell Building
Helena, MT 59620

Dear John:

Envirocon Inc., representing Burlington Northern, collected a tap sample from the C and P Packing plant, thus completing the Livingston Municipal Water System sampling program. The sample point was selected because it is at the end of a line that passes under the Livingston Rebuild Center and the railyard where residual concentrations of solvents could potentially collect. The analytical results indicate no chlorinated solvents were detected. Trihalomethanes, however, were detected and are commonly a result of chlorination at the wellhead.

Analysis of the samples was performed by Energy Laboratories, Inc., of Billings according to EPA Method 524.2. The sample was collected during the monthly ground water sampling round which followed the Quality Assurance/Quality Control procedures outlined in Section 10 of the Interim Remedial Measures Work Plan.

It is Envirocon's opinion that chlorinated solvents do not exist in the Livingston Municipal Water System as indicated by these results and the results of past sampling of the system. Envirocon does not anticipate further sampling of the water distribution system unless there is substantial evidence of solvents entering the system.

Enclosed are the analytical results from the C and P Packing plant including the spiked analysis and EPA quality control sample. A copy of the results with interpretation will be sent to the City of Livingston. The monthly ground water report will include an interpretation of analytical results from the rest of the samples collected. Should you have any questions, please call me.

Sincerely yours,

H. Crowell Herrick JT

H. Crowell Herrick, II
Staff Engineer

Enclosure
cc: Leo Berry
Mel Burda

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

ENVIROCON
PO BOX 8243
MISSOULA MT 59807

PROJECT: Livingston / BN

PAGE 1

Cd P Packing

LAB NO.	89-19118
SAMPLE IDENTIFICATION	140101-147
SAMPLE DATE	10/20/89
SAMPLE TIME	1104
VOLATILE ORGANIC CONSTITUENT	ug/l
Dichlorodifluoromethane	<1.0
Chloromethane	<1.0
Vinyl chloride	<0.50
Bromomethane	<1.0
Chloroethane	<1.0
Trichlorofluoromethane	<1.0
1,1-Dichloroethene	<0.50
Methylene Chloride	<1.0
trans-1,2-Dichloroethene	<1.0
1,1-Dichloroethane	<1.0
2,2-Dichloropropane	<1.0
cis-1,2-Dichloroethene	<1.0
Chloroform	<1.0
Bromochloromethane	<1.0
1,1,1-Trichloroethane	<0.50
Carbon Tetrachloride	<0.50
1,1-Dichloropropene	<1.0
Benzene	<0.50
1,2-Dichloroethane	<0.50
Trichloroethene	<0.50
1,2-Dichloropropane	<1.0
Bromodichloromethane	1.0
Dibromomethane	<1.0
Toluene	<1.0
1,1,2-Trichloroethane	<1.0
Tetrachloroethene	<0.50
1,3-Dichloropropane	<1.0
Dibromochloromethane	2.1
1,2-Dibromoethane	<1.0
Chlorobenzene	<1.0
1,1,1,2-Tetrachloroethane	<1.0

cc: Envirocon, Livingston

PAGE 2

LAB NO.	89-19118
SAMPLE IDENTIFICATION	140101-147
SAMPLE DATE	10/20/89
SAMPLE TIME	1104
VOLATILE ORGANIC CONSTITUENT	ug/l
Ethylbenzene	<1.0
p-Xylene	<1.0
m-Xylene	<1.0
o-Xylene	<1.0
Styrene	<1.0
Bromoform	2.4
Isopropylbenzene	<1.0
1,1,2,2-Tetrachloroethane	<1.0
Bromobenzene	<1.0
1,2,3-Trichloropropane	<1.0
n-Propylbenzene	<1.0
2-Chlorotoluene	<1.0
1,3,5-Trimethylbenzene	<1.0
4-Chlorotoluene	<1.0
tert-Butylbenzene	<1.0
1,2,4-Trimethylbenzene	<1.0
sec-Butylbenzene	<1.0
p-Isopropyltoluene	<1.0
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<0.50
n-Butylbenzene	<1.0
1,2-Dichlorobenzene	<1.0
1,2-Dibromo-3-Chloropropane	<1.0
1,2,4-Trichlorobenzene	<1.0
Hexachlorobutadiene	<1.0
Naphthalene	<1.0
1,2,3-Trichlorobenzene	<1.0
cis-1,3-Dichloropropene	<1.0
trans-1,3-Dichloropropene	<1.0

cc: Envirocon, Livingston

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

ENVIROCON
PO BOX 8243
MISSOULA MT 59807

PROJECT: Livingston/BN

Quality Assurance Spiked Analysis

CONSTITUENT	SPIKE AMOUNT ug/l	P (%)	RANGE FOR P (%)
Bromochloromethane	5.0	106	60-140
Chloroform	5.0	112	60-140
Carbon Tetrachloride	5.1	104	60-140
Trichloroethene	5.0	111	60-140
1,2-Dibromoethane	5.0	102	60-140
1,1,1,2-Tetrachloroethane	4.9	92	60-140
Tetrachloroethene	5.0	95	60-140
1,2-Dibromo-3-Chloropropane	5.0	118	60-140
1,3-Dichlorobenzene	5.0	108	60-140

P = percent recovery measured.

NOTE: Lab no. 89-19111 was spiked with the above constituents with these results.

cc: Envirocon, Livingston.

ENERGY LABORATORIES

ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
800-873-5227

ENVIROCON
PO BOX 8243
MISSOULA MT 59807

PROJECT: EPA WATER SUPPLY QUALITY
CONTROL SAMPLE

Volatile Organic Contaminants

CONSTITUENT	True Value ug/l	P (%)	Range for P (%)
Bromochloromethane			
Chloroform	5.0	111	60-140
Carbon Tetrachloride	5.0	112	60-140
Trichloroethene	5.1	100	60-140
1,2-Dibromoethane	5.0	103	60-140
1,1,1,2-Tetrachloroethane	5.0	126	60-140
Tetrachloroethene	4.9	108	60-140
1,2-Dibromo-3-Chloropropane	5.0	82	60-140
1,3-Dichlorobenzene	5.0	109	60-140
	5.0	107	60-140

P = percent recovery measured.

NOTE: This EPA Quality Control sample was analyzed with your lab no.s 89-19103 thru 89-19114 with the above results

cc: Envirocon, Livingston.

ENVIROCON, INC.

101 INTERNATIONAL WAY
POST OFFICE BOX 8243
MISSOULA, MONTANA 59807
TELEPHONE: (406) 523-1150
FAX: (406) 721-4794

October 16, 1989

ENVIROCON, INC.

John Arrigo
Water Quality Bureau
Room B201
Cogswell Building
Helena, MT 59620

Dear John:

Envirocon has completed the water sampling program of the Livingston Municipal Water System. Six samples were collected, five of which were from taps. The analytical results showed no concentrations of chlorinated solvents. However, trihalomethanes were detected.

Enclosed is the sampling program report containing the laboratory results. The report also responds to comments submitted by you regarding the selection of sample locations. Envirocon will be collecting one additional sample from a dead-end line under the Livingston Rebuild Center. This sample will be taken during the monthly sampling round scheduled for later this month. You will be informed of the analytical results under separate cover from the monthly sampling report.

Persons whose taps were sampled will be sent a copy of the results from their tap water sample. An explanation for the presence of the trihalomethanes will be included. A copy of the report will be sent to the City of Livingston.

Sincerely yours,

H. Crowell Herrick, II
Staff Engineer

\sh
encl.

ENVIROCON, INC.

101 INTERNATIONAL WAY
POST OFFICE BOX 8243
MISSOULA, MONTANA 59807
TELEPHONE: (406) 523-1150
FAX: (406) 721-4794

ENVIROCON, INC.

October 18, 1989

John Arrigo
Water Quality Bureau
Room B201
Cogswell Building
Helena, MT 59620

Dear John:

Enclosed find a copy of a letter dated October 16, 1989, from Crowell Herrick. Please note the highlighted addition. This was inadvertently deleted on the original.

Please accept the apologies of our word processing department as this significantly changes the essence of the message.

Again, we are sorry for any inconvenience this may have caused.

Sincerely,

Heidi Vandivere

Heidi Vandivere

enclosure

A *Washington* Company

ENVIROCON, INC.

101 INTERNATIONAL WAY
POST OFFICE BOX 8243
MISSOULA, MONTANA 59807
TELEPHONE: (406) 523-1150
FAX: (406) 721-4794

ENVIROCON, INC.

October 16, 1989

John Arrigo
Water Quality Bureau
Room B201
Cogswell Building
Helena, MT 59620

Dear John:

Envirocon has completed the water sampling program of the Livingston Municipal Water System. Six samples were collected, five of which were from taps. The analytical results showed no concentrations of trihalomethanes were detected.

Enclosed is the sampling program report containing the laboratory results. The report also responds to comments submitted by you regarding the selection of sample locations. Envirocon will be collecting one additional sample from a dead-end line under the Livingston Rebuild Center. This sample will be taken during the monthly sampling round scheduled for later this month. You will be informed of the analytical results under separate cover from the monthly sampling report.

Persons whose taps were sampled will be sent a copy of the results from their tap water sample. An explanation for the presence of the trihalomethanes will be included. A copy of the report will be sent to the City of Livingston.

Sincerely yours,

Heidi Andriacco /FOR
H. Crowell Herrick, II
Staff Engineer

\sh
encl.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR
COGSWELL BUILDING
STATE OF MONTANA
FAX # (406) 444-2606
HELENA, MONTANA 59620

September 26, 1989

Kris Kok
Envirocon, Inc.
P.O. Box 8243
Missoula, MT 59807

RE: Sampling Livingston Water Distribution System

Dear Kris:

Dave Aune from the Bureau's Public Water Supply Section and I reviewed your August 15, 1989 proposal on sampling locations to detect contaminants which may be present in the water distribution system. Some of these comments were relayed to Envirocon during the last work plan review session held in Livingston. I recently reviewed your September 8 proposal to add two more residential sampling locations.

I understand from our phone conversation yesterday afternoon that samples from five taps near dead end lines in the area of the Q and L Street wells and one other sample from a storage tank were collected during the week of September 18. I agree with the collection of these samples from the specified locations, however additional samples may be necessary. Although untimely, I offer the following comments for your consideration. Please review the comments to see if your selection of sample sites addressed the items of concern.

1. During peak daily demand the system pumps and storage system are taxed so hydraulic pressures are lowered in some locations. The degree of pressure drop is difficult to determine without operational records (pressures) and/or some sort of computer analysis. Infiltration of contaminants could occur if pressures within the system are lowered significantly during peak demand in areas where old, leaking distribution pipes are submerged below contaminated ground water. Although reportedly rare, it is possible that some of the pipes in the southeast portion of the city may at times be below the water table.

2. The age and construction of water lines must be evaluated. Are there any portions of the distribution system that are constructed of PVC pipe? PVC has some permeability and some organic contaminants may migrate through the pipe wall or degrade glued PVC pipe joints.

"AN EQUAL OPPORTUNITY EMPLOYER"